

THE BEES OF NEW MEXICO.

BY T. D. A. COCKERELL.

More species of bees are known from New Mexico than from any other State or Territory. This is not to be explained merely as the result of diligent collecting,—indeed the work done does not nearly cover the ground, and whole regions, and doubtless dozens of species, remain unknown. The vast area—difficult to appreciate unless one has travelled over it—and the combination of desert, mountain and valley afford such a variety of conditions that we have in fact not one fauna, but several; and any statements about New Mexico, without further details, become comparatively meaningless. If proof is wanted, that in spite of all that has been done, abundant riches remain, it is afforded by the results of the Academy of Natural Sciences expedition to Alamogordo and the Sacramento Mountains several years ago. I went over most of the bees collected by Mr. Viereck, when he visited me at Las Vegas, and was interested to see many new species, even several of the genus *Perdita*, which had been my especial study. Unfortunately, much of this material still remains undescribed or unreported, and I am unable to incorporate all the important data it would afford. There is no doubt that bees, from the number of species, the ease with which they are collected, and the restricted distribution of many, afford excellent material for defining zoological regions and life zones. That they have not been used to any extent for such purposes must be explained by the inadequacy of existing collections and records, and especially the difficulty of determining the species. The difficulties of determination are not especially the fault of those who have described these insects, but necessarily result from the extraordinary wealth of still undescribed species. An insect may appear to be so and-so, but it is necessary to examine it with great care, as it may present some peculiarity, in some part of its anatomy, showing it to be a hitherto unknown form. Thus it will not be safe to trust to superficial appearances until the fauna has been much more thoroughly worked up.

In the following enumeration of New Mexico bees, I have divided the species of each genus into groups according to their zonal distri-

bution. It is hoped that this method may be of service to those who are working on the distribution of bees, while of course all subsequent studies concerned with the same species will tend to establish or disprove the validity of my groupings. It will be noted that while the majority of the species are characteristic of particular zones, or are at least especially austral or boreal, a few range widely through many zones.

I have not given all the details of dates and flower-records, etc., most of which have already appeared in connection with the descriptions and records of the species in various publications.*

The following abbreviations are used :

Localities : M. V. = Mesilla Valley ; L. V. = Las Vegas ; L. V. H. S. = Las Vegas Hot Springs ; S. F. = Santa Fé.

Collectors : C. = T. D. A. Cockerell ; W. P. C. = Wilmatte Porter Cockerell ; V. = H. L. Viereck.

Particulars concerning the localities will be found in Proc. Davenport Acad. Sci., IX, pp. 8-14.

An asterisk following the name of a locality signifies that it is the type-locality of the species or subspecies.

PROSOPIS Fabr.

Hudsonian to Canadian.

- P. basalis* Smith. Top of Las Vegas Range (11,000 ft.); Beulah.
P. varifrons Cress. Top of Las Vegas Range; Beulah; Dailey Canon.

Canadian Zone.

- P. antennata* Cress. Beulah, prox. 8000 ft. Fls. *Roripa*.
P. rudbeckiæ ruidosensis Ckll. Beulah; Rio Ruidoso.* Fls. *Scrophularia*.
P. tridens Ckll. Beulah. Typ. loc. in Colo., at 7000 ft.
P. rugosula Ckll. Beulah. Typ. loc. in Colo., at 9500 ft. Fls. *Roripa*.
P. digitata Ckll. Beulah. Typ. loc. in Colo.
P. nucleolus Vier. Beulah.* Fls. *Salix*.
P. ænigma Vier. Beulah.*
P. clandestina Vier. Beulah.*
P. citrinifrons Ckll. Beulah. Typ. loc. in Colo., at 8500 ft.
P. wootoni Ckll. Beulah; Rio Ruidoso.* Fls. *Scrophularia*.
P. tuertonis Ckll. Tuerto Mtn., near S. F., 8550 ft.*; also Florissant, Colo. (Rohwer.) This is the species cited without name in *Entomologist*, 1898, p. 217 (♀).

* See especially Tables for the Determination of New Mexico Bees, in Bull. Sci. Lab. Denison University, Vol. XI (1898).

Canadian and Transition.

- P. tridentula* Ckll. Beulah; Mescalero; Rio Ruidoso. Typ. loc. in Colo., at 9500 ft.

Transition Zone.

- P. rudbeckiæ* Ckll. and Casad. S. F.* (7000 ft.)

Upper Sonoran Zone.

- P. divergens* Ckll. Pecos. Typ. loc. in Colo., at 7000 ft.
P. asinina bigeloviæ Ckll. Albuquerque.*

Upper to Middle Sonoran.

- P. mesillæ* Ckll. M. V.,* L. V., Pecos. Extends to Phoenix, Ariz. (Lower Sonoran.)
P. asinina Ckll. and Casad. M. V.,* Pecos.

COLLETES Latr.

The new records, of which details are given, are derived from a small series kindly identified by Mr. Swenk.

Hudsonian to Canadian.

- C. nigrifrons* Titus. Top of Las Vegas Range; Crew's Mesa; Beulah (B. Chapman).
C. oromontis Vier. Top of Las Vegas Range, June 28th, ♀ (C.); Beulah.*

Canadian Zone.

- C. bigeloviæ* Ckll. Beulah; Sacramento Mts.*
C. brevispinosus Vier. Beulah.* Mr. Swenk believes that *bigeloviæ* and *brevispinosus* ought not to be separated from *armatus*.
C. kincaidii Ckll. Rio Ruidoso.
C. spurcus Vier. Beulah*; Dailey Canon, Aug. 10th (T. and W. Ckll.).
C. delodontus Vier. Beulah.* Fls. *Roripa*.
C. paniscus Vier. Beulah.*
C. zonatus Vier. Beulah.* Fls. *Prunus*.

Canadian to Upper Sonoran.

- C. simulans* Cress. Beulah (M. D. Ckll.); Embudo. Mr. Viereck states that Cresson's *simulans* included two species, one with, the other without, dark hairs on the thorax above. He considers the latter the true type, though I took the former for such in my table in *Psyche*, October, 1905. Mr. Swenk writes that he now believes that the insect he recorded as *simulans* from Olympia, Wash., was only a small *kincaidii*; he also holds that my *C. andrewsi* is the ♀ of true *simulans*, of which he has both sexes from Sioux Co., Nebraska.
C. skinneri Vier. Beulah*; Pecos, Aug. 31st (C.).

Canadian to Middle Sonoran.

- C. armata* Patton. Beulah (C., W. P. C.); Sapello Canon, Aug. 31st (W. P. C.); San Ignacio, Sept. 1st (T. and W. Ckll.); Albuquerque; M. V. The identifications of Canadian and Transition Zone material are by Mr. Swenk, and probably refer to the segregated forms cited above as *bigelovix* and *brevispinosus*.

Transition Zone.

- C. chamæsarachæ* Ckll. S. F.* Fls. *Chamæsaracha*.
C. aberrans Ckll. S. F.* Mr. Swenk has found this a common visitor of *Petalostemon* on the Nebraska sand hills.

Transition to Upper Sonoran.

- C. gilensis* Ckll. Gila River*; Gallinas River; Sacramento Mts.; Pecos; L. V., Aug. 9, fls. *Melilotus alba*, ♀ (W. P. C.), Aug. 11th, fls. *Solidago canadensis* (W. P. C.).

Transition to Middle Sonoran.

- C. utilis* Ckll. High Rolls (V.); M. V.*
C. americana Cress. S. F.; Gila River; Tuerto Mtn.; Embudo; Watrous; L. V.; M. V.

Upper Sonoran.

- C. wilmattæ* Ckll. Pecos.* Mr. Swenk has taken this in Nebraska, and finds it an oligotropic visitor of *Petalostemon*.
C. robustus Swenk. L. V., July 21, ♀, fls. *Petalostemon oligophyllus* (C.), Aug. 11, ♀, fls. *Solidago canadensis* (W. P. C.). Mr. Swenk now holds that this is identical with *C. robertsonii* D. T.
C. regularis Swenk. Albuquerque, Aug., 1894, ♀ (Snow), fide Swenk.
C. wootoni Ckl. Rio Ruidoso, 6400 ft.*; Riley's Ranch, Organ Mts., Aug. 29. fls. *Lippia wrightii*, ♂ (C.); M. V.

Middle Sonoran.

- C. crucis* Ckll. M. V.*
C. daleæ Ckll. M. V.*
C. texana Cress. M. V. Fls. *Salix*.
C. prosopidis Ckll. M. V.* Fls. *Prosopis*.
C. salicicola Ckll. M. V.* Fls. *Salix*.
C. annæ Ckll. M. V.*
C. louisæ Ckll. M. V.*
C. gypsicolens Ckll. White Sands.*
C. algarobiæ Ckll. M. V.* Fls. *Prosopis*.

CAUPOLICANA Spinola.

- C. yarrowi* Cress. Albuquerque (Snow, 1894); El Rito; Organ Mts.

SPHECODES Latr.*Canadian Zone.*

- S. fragariæ* Ckll. Beulah.*

Transition Zone.

S. asclepiadis Ckll. S. F.*

Upper Sonoran Zone.

S. veganus Ckll. L. V.*

S. arroyanus Ckll. L. V. (Arroyo Pecos).*

S. pecosensis Ckll. Pecos.*

Upper and Middle Sonoran.

S. mandibularis Cress. Mescalero; M. V.

Middle Sonoran.

S. semicoloratus Ckll. M. V.*

S. fortior Ckll. M. V.*

S. sophiæ Ckll. M. V.*

S. perlustrans Ckll. M. V.*

PROTERANER Robt.

P. rhois Ckll. Rio Ruidoso.*

SPHECODOGASTRA Ashm.

S. texana Cress. M. V.

HALICTUS Latr.*Hudsonian Zone.*

H. virgatellus Ckll. Top of Las Vegas Range.*

H. dasiphoræ Ckll. Top of Las Vegas Range.*

H. veganus Ckll. Top of Las Vegas Range.*

H. peraltus Ckll. Top of Las Vegas Range.*

Hudsonian to Canadian.

H. hemimelas Ckll. Top of Las Vegas Range* ; Clouderoft (V.).

Canadian Zone.

H. aquilæ Ckll. Harvey's Ranch (9600 ft.); White Mts.* ; Beulah.

H. similis Smith. Dailey Canon.

H. parallelus Say. Beulah.

H. niger Vier. Beulah.*

Canadian to Transition.

H. lerouxii Lep. Beulah; L. V. H. S.

H. semicæruleus Ckll. Clouderoft (V.). S. F.*

Canadian to Upper Sonoran.

H. trizonatus Cress. Beulah; Rio Ruidoso; Trout Spring; Bernalillo; Paraje; Pecos; Johnson Park, July 4, fls. *Rosa* (Anna Gohrman). This is what has been previously reported as *coriaceus* Sm.; Mr. Crawford states that it is distinct from the true *coriaceus* of the E. States.

Canadian to Middle Sonoran.

- H. bardus* Cress. Beulah; Organ Mts.; M. V.
H. sisymbrii Ckll. Beulah; S. F.; L. V.; Watrous; M. V.*
H. ruidosensis Ckll. Beulah; S. F.; Rio Ruidoso*; Mescalero; Pecos; M. V.; Alamogordo (V.).

Transition.

- H. pecosensis* Crawf. Pecos Canon, 7200 ft. Fls. *Holodiscus*.*

Transition to Upper Sonoran.

- H. ovaliceps* Ckll. S. F.*; Pecos.
H. tripartitus Ckll. S. F.*; Organ Mts.
H. perdifficilis Ckll. S. F.*; Mescalero; Placita; Pecos.

Transition to Middle Sonoran.

- H. cockerelli* Crawf. S. F.*; Mesilla.
H. armaticeps Cress. S. F.; L. V.; Mescalero; M. V.; Raton.
H. pectoraloides Ckll. S. F.; Roswell; M. V.*
H. subobscurus Ckll. S. F.; M. V.*

Upper Sonoran.

- H. forbesi* Rob. Mescalero.
H. galpinsisæ Ckll. Pecos*; L. V.
H. clematisellus Ckll. Pecos.*

Upper to Middle Sonoran.

- H. amicus* Ckll. Gila River; Organ Mts.; M. V.*
H. tripartitus melliloti Ckll. Mescalero; M. V.* Extends to Phoenix, Ariz. (Lower Sonoran.)
H. pruiniformis Crawf. Pecos; L. V.; M. V. This has been referred in error to *pruinus* Rob.
H. mesillensis Ckll. L. V., M. V.*

Middle Sonoran.

- H. angustior* Ckll. M. V.*
H. pseudotegularis Ckll. M. V. Type locality in tropical Mexico, and Mr. Crawford has it from Costa Rica.
H. oleosus Ckll. M. V.*
H. semibrunneus Ckll. M. V.*
H. ashmeadi Rob. M. V.

DIALICTUS Rob.*Upper Sonoran.*

- D. occidentalis* Crawf. L. V.*
D. theodori Craw. L. V.*

CONANTHALICTUS Ckll.

C. conanthi Ckll. M. V.*

Mr. Crawford has sent me an allied species of this genus from Cotulla, Texas.

HEMIALICTUS Ckll.

H. lustrans Ckll. L. V., Lone Mtu.*

AUGOCHLORA Smith.

A. neglectula Ckll. M. V., Organ Mts.*

A. confusa Rob. Trout Spring.

A. confusa coloradensis Titus. Mesilla Park (M. D. Ckll.); Roswell.

AGAPOSTEMON Smith.*Transition to Middle Sonoran.*

A. texanus Cress. S. F.; Mescalero; Gila R.; Romersville; L. V.; Embudo; Gallinas R. at Las Valles; Pecos; M. V.; Organ Mts.

Upper Sonoran.

A. viridulus Fabr. La Cueva, Organ Mts.

Middle Sonoran.

A. melliventris Cress. Vega S. José; Rincon; M. V.

A. radiatus Say. M. V.

A. cockerelli Crawf. M. V.*

ANDRENA Fabr.*Hudsonian Zone.*

A. merriami Ckll. Top of Las Vegas Range.*

Hudsonian to Canadian.

A. birtwelli Ckll. Top of Las Vegas Range; * Beulah, fls. *Heracleum*. In Colorado this has been taken at a much lower altitude (Colorado Springs, 6000 ft.).

Hudsonian to Transition.

A. apacheorum Ckll. Top of Las Vegas Range; Beulah; Mescalero; Sacramento Mts.*

Canadian Zone.

A. sapellonis Ckll. Beulah, fls. *Thlaspi*.*

A. carlini Ckll. Beulah. Typ. loc. in Illinois.

A. pacta Vier. Beulah.*

A. grandior Ckll. Beulah.

A. segregans Ckll. Beulah.*

A. atala Vier. Beulah.* Visits *Polemonium* at Florissant, Colorado.

A. delta Vier. Beulah.*

A. barberi Ckll. Rio Ruidoso.*

- A. chromotricha* Ckll. Rio Ruidoso.
A. chromotricha beulahensis Vier. Beulah.* Mr. Viereck now holds that his *A. beulahensis* is a variety of *chromotricha*.
A. chromotricha clypeonitens Ckll. Beulah. Mr. Viereck considers that his *A. truncata* is identical with *clypeonitens* (described from Wisconsin), and believes that the latter is a variety of *chromotricha*.
A. occidentalis Ckll. Beulah; Santa Fé Canon.* This was described as a variety of *platyparia* Rob. (*fragilis* Smith), and was later even considered doubtful as a variety. Upon comparison with a male *platyparia* from Milwaukee, received from Dr. Graenicher, I find that *occidentalis* is apparently a distinct species; known by its larger head, with the eyes diverging below, and the sides of the vertex (viewed from in front) presenting a more distinct angle.

Canadian to Transition.

- A. hirticincta* Prov. Beulah; San Ignacio.

Canadian to Upper Sonoran.

- A. argemonis* Ckll. Beulah; S. F.*; Rio Ruidoso; Las Valles; San Germino; Pecos; Glorieta, fls. *Argemone intermedia*; L. V.; Beatty's Cabin (W. P. C.).
A. helianthi Rob. Beulah (var. ♂, with hair of thorax bright ferruginous); Rociada; Pecos; L. V.; Albuquerque.

Transition.

- A. cerasifolli* Ckll. S. F.*
A. johnsoniana Ckll. Johnson Mesa.*
A. xanthigera Ckll. San Ignacio.*
A. canadensis D. T. (*simulata* Prov.) San Ignacio. The record relates to *A. albobirgata* Ckll., which Mr. Viereck says he cannot separate from *simulata*.
A. nitidior Ckll. San Ignacio.*
A. semirufa Ckll. L. V. H. S.*
A. erythrogastra Ashm. Placita. Typ. loc. in Colorado.
A. pluvialis Ckll. Placita. Typ. loc. Olympia, Wash.

Transition to Upper Sonoran.

- A. placitæ* Ckll. Placita* ; L. V.
A. cratægi Rob. L. V. H. S. (a variety); Pecos (det. Viereck).
A. cressoni kansensis Ckll. Placita; Las Valles; both localities are on the Gallinas River.
A. aureocincta Ckll. S. F.*; Glorieta, fls. *Gutierrezia sarothrae*, Aug. 23, ♂ (W. P. C.); Pecos, Sept.; San Ignacio.
A. mentzelia Ckll. S. F.*; Pecos.
A. porteræ Ckll. L. V. H. S.,* and down the Gallinas R. well into the Upper Austral.

Transition to Middle Sonoran.

- A. mimetica* Ckll. Placita* ; Alamogordo, May 26-29 (V.).
A. prunorum Ckll. S. F.; Las Valles; Pecos; Paraje; Johnson Park, July 4, fls. *Rosa* (Anna Gohrman); M. V.*

Upper Sonoran.

- A. aliciarum Ckll. Organ Mts.*
 A. vulpicolor Ckll. Embudo.*
 A. prunifloris Ckll. Paraje.* The locality of this and the next is almost Middle Sonoran.
 A. subaustralis Ckll. Paraje.* Mr. Viereck has recorded this species from Oregon, Washington and Vancouver Island, a most unexpected range!

Upper to Middle Sonoran.

- A. sphecodina Casad. & Ckll. Paraje; M. V.* This scarcely enters the Upper Sonoran, Paraje being on the border of the Middle Sonoran.
 A. mellea Cress. L. V.; Pecos, June 26; Glorieta, fls. *Argemone intermedia*, Aug. 23, ♀; Alamogordo (V.). This is more especially an Upper Sonoran form.
 A. salicinella Ckll. Las Valles; Paraje; M. V.* North to Boulder, Colo.

Middle Sonoran.

- A. mesillæ Ckll. M. V.*
 A. prima Casad. M. V.*
 A. jessicæ Ckll. M. V.*
 A. casadæ Ckll. M. V.*
 A. nigerrima Casad. M. V.*
 A. pulchella Rob. M. V.
 A. capricornis Casad. and Ckll. M. V.*
 A. primulifrons Casad. M. V.*
 A. fracta Casad. and Ckll. M. V.*
 A. electrica Casad. and Ckll. M. V.*
 A. monilicornis Ckll. M. V.*

CALLANDRENA Ckll.

- C. pectidis Ckll. M. V.*; flies in September, fls. *Pectis*.

PARANDRENA Rob.

- P. andreoides Cress. Gallinas River; Paraje; M. V.

HESPERAPIS Ckll.*Middle Sonoran.*

- H. olivivæ Ckll. M. V.*; flies in September, fls. *Pectis*.
 H. rhodocerata Ckll. M. V.*; flies in September, fls. *Pectis* and *Verbesina*.
 H. elegantula Ckll. M. V.*; flies in April.
 H. n. sp. Vier. Alamogordo (V.); Mesilla Park, May 16. Fls. *Larrea* (C.).

PROTOXÆA Ckll. and Porter.

- P. gloriosa Fox. M. V.*

NOMIA Latr.

I omit the two species described from the "Santa Fé district" by Cameron, as they are doubtless Mexican. I also omit the *Oxœa* and *Osmia* from the same collection.

Transition to Middle Sonoran.

N. foxii D. T. S. F.; Rincon; M. V.; Vega S. José. Typ. loc. Denver, Colo.

Upper and Middle Sonoran.

N. nevadensis Cress. Albuquerque; La Luz; M. V.

N. triangulifera Vachal. Albuquerque; M. V., flies in Sept., fls. *Helianthus*.

N. nortoni Cress. L. V.; Roswell. This and *foxii* seem not to occupy the same ground, *foxii* being more western.

DIEUNOMIA Ckll.

D. apacha Cress. "New Mexico."

D. marginipennis Cress. "New Mexico."

D. xerophila Ckll. Aztec; M. V.,* flies in Sept., fls. *Verbesina*.

D. mesillæ Ckll. M. V.,* flies in July.

PROTANDRENA Ckll.*Transition to Upper Sonoran.*

P. asclepiadis Ckll. S. F.*; Albuquerque.

Upper Sonoran.

P. trifoliata Ckll. Albuquerque.*

Middle Sonoran.

P. mexicanorum Ckll. M. V.

P. heteromorpha Ckll. M. V.*

HALICTOIDES Nyl.*Hudsonian Zone.*

H. maurus Cress. Top of Las Vegas Range.

Canadian Zone.

H. harveyi Ckll. Harvey's Ranch, Las Vegas Mts.*

H. oryx Vier. Beulah.*

Canadian to Middle Sonoran.

H. marginatus Cress. Beulah; S. F.; Rinconada; M. V.

Upper Sonoran.

H. tinsleyi Ckll. Organ Mts.*

Middle Sonoran.

H. fallugiæ Ckll. M. V.,* end of April, fls. *Fallugia*.

PSEUDOPANURGUS Ckll.

P. pectidellus Ckll. Organ Mts.,* in Aug., fls. *Pectis*, in company with *Perdita solitaria*.

P. æthiops Cress. Albuquerque; M. V. Fls. *Helianthus*.

P. fraterculus Ckll. Albuquerque; M. V.* Fls. *Isocoma*.

PANURGINUS Nyl.*Hudsonian to Canadian.*

- P. verus* Ckll. Top of Las Vegas Range^{*}; Crew's Mesa; Beulah.
P. bakeri Ckll. Top of Las Vegas Range; Beulah.
P. cressoniellus Ckll. Top of Las Vegas Range; Beulah.

Canadian Zone.

- P. porterae* Ckll. Beulah.^{*}
P. atricornis Cress. Beulah.
P. nigrinus Vier. Beulah.^{*}
P. citrinifrons Vier. Beulah.^{*}
P. neomexicanus Ckll. Rio Ruidoso.^{*}

Transition Zone.

- P. albitarsis* Cress. S. F. Fls. *Rudbeckia*.

Transition to Upper Sonoran.

- P. boylei* Ckll. S. F.,^{*} L. V. Fls. *Cleome*.
P. pauper flavotincta Ckll. S. F.,^{*} L. V., Organ Mts.
P. innuptus Ckll. Mescalero. This locality is on the border of the Transition and Upper Sonoran.
P. barberi Ckll. Mescalero.^{*}

Upper Sonoran.

- P. townsendi* Ckll. Organ Mts.^{*}
P. hirsutifrons Ckll. Albuquerque.^{*}

Middle Sonoran.

- P. renimaculatus* Ckll. M. V. Typ. loc. in Colo., fls. *Solidago*.
P. perlævis Ckll. M. V.^{*}

SPINOLIELLA Ashm.

- S. scitula* Cress. S. F.; L. V.
S. australior Ckll. Albuquerque^{*}; M. V.
S. meliloti Ckll. M. V.^{*} Fls. *Melilotus*.

CALLIOPSIS Smith.*Transition.*

- C. rhodophilus* Ckll. S. F.^{*}

Transition to Upper Sonoran.

- C. coloradensis* Cress. S. F.; L. V.; Embudo; Organ Mts.; Glorieta, fls. *Gutierrezia sarothrae*, Aug. 23 (W. P. C.).

Upper Sonoran.

C. lepidus Cress. L. V.

C. teucarii Ckll. L. V.*

C. verbenæ Ckll. and Porter. L. V.*; Pecos, July 7, fls. *Verbena bipinnatifida*.

C. chlorops Ckll. L. V.*; Pecos.

Middle Sonoran.

C. coloratipes Ckll. M. V.* Extends to Phoenix, Ariz. (Lower Sonoran).
Fls. *Isocoma*.

HYPOMACROTERA Ckll and Porter.*Upper Sonoran.*

H. callops Ckll. and Porter. L. V.*, in August, fls. *Chamæsaracha*.

Middle Sonoran.

H. semirufa Ckll. M. V.*

H. subalpina Ckll. M. V.*

MACROTEROPSIS Ashm.

M. latior Ckll. M. V.*

PERDITA Smith.*Canadian to Upper Sonoran.*

P. zebrata Cress. Beulah (very rare); Gallinas River; S. F.; L. V.; Pecos;
Glorieta, Aug. 23, fls. *Cleome*; Albuquerque; Lamy; Watrous; Alma,
Socorro County.

Transition.

P. foxi Ckll. S. F.*

P. snowi Ckll. S. F.

Transition to Upper Sonoran.

P. chamæsarachæ Ckll. S. F.; L. V.; Albuquerque*; Roswell.

P. sexmaculata Ckll. S. F.*; L. V.; Roswell. Fls. *Chamæsaracha*.

P. sphæralcææ alticola Ckll. S. F.*; Pecos. The mut. *suffusa* Ckll. has the
same range.

P. mentzeliiæ Ckll. S. F.*; Pecos; near Tularosa (Wooton); Raton. At Pecos
it visits the flowers of *Nuttallia rusbyi* (*Mentzelia rusbyi* Wooton, 1898).

P. lepachidis Ckll. S. F.*; Socorro.

Upper Sonoran.

P. stottleri Ckll. Sacramento Mts.*; Pecos, fls. *Gutierrezia*.

P. phaceliæ Ckll. Organ Mts.*

P. anogræ Ckll. L. V.*

P. mentzeliarum Ckll. Organ Mts.*; near Tularosa (Wooton).

P. mentzeliarum lauta Ckll. Near Tularosa* (Wooton). Three species of
Perdita were taken by Wooton at flowers of a *Nuttallia* doubtfully referred
at the time to "*wrightii* or *multiflora*," but no doubt really *Nuttallia perennis*
(*Mentzelia perennis* Wooton, 1898).

- P. crotonis* Ckll. La Tenaja; between Rowe and Old Pecos Pueblo, fls. *Croton*,
Sept. 4 (W. P. C.); Albuquerque.*
P. gutierreziae Ckll. Albuquerque.*
P. albipennis Cress. Albuquerque.
P. affinis Cress. Embudo; Pecos, Aug. 24, fls. *Grindelia inornata*, ♂, ♀ (W. P.
C.); (Glorieta, Aug. 23, fls. *Chrysopsis villosa*, ♂, ♀ (W. P. C.).
P. wootonæ Ckll. Near Tularosa.*
P. rhodura Ckll. Embudo.*
P. subfasciata Ckll. Embudo.*
P. solitaria Ckll. Organ Mts.*
P. chrysophila Ckll. Pecos; Organ Mts.*

Upper to Middle Sonoran.

- P. grandiceps* Ckll. Organ Mts.; M. V.*; Alamogordo (V.).
P. pulchrior Ckll. Albuquerque* ; M. V.
P. sphæralceæ Ckll. Organ Mts.; M. V.*; Alamogordo (V.).
P. pallidior Ckll. Albuquerque* ; M. V.
P. crassiceps Ckll. Albuquerque* ; M. V.
P. bigeloviae Ckll. Albuquerque* ; M. V.
P. townsendi Ckll. Embudo; White Sands.*
P. albovittata Ckll. Organ Mts.*; M. V.
P. austini Ckll. Albuquerque* ; M. V.

Middle Sonoran.

- P. beata* Ckll. M. V.*
P. luteola Ckll. M. V.*
P. larreæ Ckll. San Marcial.*
P. larreæ modesta Ckll. M. V.*
P. marcialis Ckll. San Marcial* ; Alamogordo (V.).
P. punctosignata Ckll. M. V.* Extends to S. José de Guaymas, Mex. (Lower
Sonoran).
P. maculigera Ckll. M. V.*
P. semicrocea Ckll. M. V.*
P. sidæ Ckll. M. V.*
P. cladothricis Ckll. M. V.*
P. æneifrons Ckll. M. V.*
P. semicærulea Ckll. San Marcial* ; Alamogordo (V.).
P. phymatæ Ckll. M. V.*
P. pellucida Ckll. M. V.*
P. pectidis Ckll. M. V.*
P. perpulchra Ckll. M. V.*
P. biparticeps Ckll. M. V.*
P. erigeronis Ckll. M. V.*
P. hirsuta Ckll. M. V.*
P. maculipes Ckll. M. V.*
P. martini Ckll. M. V.*
P. salicis Ckll. M. V.* Extends to S. José de Guaymas, Mex. (Lower Sonoran).
P. nitidella Ckll. M. V.*

- P. exclamans* Ckll. M. V.* Extends to S. José de Guaymas, Mexico (Lower Sonoran).
P. senecionis Ckll. M. V.*
P. verbesinæ Ckll. M. V.*; with mutations *nigrior* Ckll., *intermedia* Ckll., *maculata* Ckll. and *cyanella* Ckll.
P. asteris Ckll. M. V.* Extends to Salt River Valley, Ariz. (Lower Sonoran).
P. larrearum Ckll. San Marcial.*
P. vagans Ckll. M. V.*
P. vespertilio Ckll. M. V.*
P. chrysoceras Ckll. M. V.*
P. ignota Ckll. M. V.*
P. fallax Ckll. M. V.*
P. albipennis helianthi Ckll. M. V.*
P. callicerata Ckll. M. V.*
P. numerata Ckll. M. V.*
P. laticeps Ckll. M. V.*
P. tarda Ckll. M. V.* Extends, in modified form, to S. José de Guaymas, Mex. (Lower Sonoran).
P. howardi Ckll. Alamogordo (V.). Typ. loc. San José de Guaymas, Mexico (Lower Sonoran).
P. n. sp. Vier. Alamogordo, at *Dasytirion* (V.).

Locality Unknown.

- P. nuda* Ckll. "New Mexico."*

NOMADA Fabr.

Canadian Zone.

- N. zebrata* Cress. Beulah; Eagle Creek, White Mts.
N. beulahensis Ckll. Beulah.*
N. aquilarum Ckll. Eagle Creek, White Mts.*
N. schwarzi contractula Ckll. Beulah.*
N. ruidosensis Ckll. Rio Ruidoso.*

Canadian to Upper Sonoran.

- N. taraxacella* Ckll. Near Viveash Ranch, 8800 ft.; Pecos; Placita.*

Transition to Upper Sonoran.

- N. vegana* Ckll. S. F.; L. V.*

Upper Sonoran.

- N. xanthophila* Ckll. L. V.*
N. fragilis Cress. Pecos, fls. *Salix*.
N. placitensis Ckll. Placita,* fls. *Prunus*.
N. lippinæ Ckll. La Cueva, Organ Mts.* Visits *Lippia*.
N. pecosensis Ckll. Pecos.*
N. vallesina Ckll. Las Valles.*

Middle Sonoran.

- N. martinella* Ckll. M. V.*
N. crucis Ckll. M. V.* Visits *Verbesina*.
N. pennigera Ckll. M. V.*
N. sidæfloris Ckll. M. V.*
N. gutierreziae Ckll. M. V.*
N. vierecki Ckll. M. V. Visits *Aster* and *Dithyræa*. Type loc. Juarez, Mexico (Middle Sonoran).
N. neomexicana Ckll. Rincon; Deming.* Visits *Verbesina* and *Prosopis*.
N. sophiarum Ckll. M. V.* Visits *Sophia*.

NEOLARRA Ashm.

- N. pruinosa* Ashm. Glorieta, Aug. 23; M. V. Type loc. West Cliff, Colorado, 7840 ft.
N. verbesinæ Ckll. M. V.*

PHILEREMULUS Ckll.

- P. vigilans* Ckll. M. V.*
P. nanus Ckll. S. F.*; L. V.

NEOPASITES Ashm.

- N. pulchellus* Cress. S. F. Type from Colorado; I took it at Colorado Springs, June 20, 1906.

DIOXYS Lep.

- D. productus subruber* Ckll. M. V.*
D. martii Ckll. Picacho Mtn., M. V.*, March 25, fls. *Sphæralcea martii*.

PHILEREMUS Latr.

- P. americanus* Cress. Beulah. Type from Canada.
P. mesillæ Ckll. M. V.*

EPEOLUS Latr.

- E. beulahensis* Ckll. Beulah.*
E. crucis Ckll. M. V.*

TRIEPEOLUS Rob.*Canadian to Upper Sonoran.*

- T. occidentalis* Cress. Beulah (? was *fraseræ*); Mescalero. Type from Colo.
T. cressoni fraseræ Ckll. Beulah*; L. V.

Transition to Upper Sonoran.

- T. cressoni* Rob. San Ignacio; L. V.
T. helianthi Rob. Near San Ignacio; Aztec.

Transition to Middle Sonoran.

- T. segregatus* Ckll. S. F.; L. V. H. S.*; L. V.; Albuquerque (? was *isocomæ*); M. V.

Upper Sonoran.

- T. martini* Ckll. Romeroville.*
T. nevadensis Cress. Albuquerque. Type from Nevada.
T. isocomæ Ckll. Albuquerque.*

Upper to Middle Sonoran.

- T. lunatus* Say. Organ Mts.; M. V.

Middle Sonoran.

- T. verbosinæ* Ckll. M. V.; Deming.*
T. texanus Cress. M. V. Type from Texas.
T. texanus nigripes Ckll. M. V.*
T. mesillæ Ckll. M. V.*

Locality Unknown.

- T. robustus* Cress. "New Mexico."*
T. concavus Cress. "New Mexico."*

ERICROCIS Cress.

- E. lata* Cress. M. V. Type from Texas.

MELECTA Latr.

- M. miranda* Fox. S. F.; L. V.; Pecos, at nests of *Anthophora occidentalis* (W. P. C.); Mescalero; M. V. Typ. loc. Rapid City, S. Dak.
M. interrupta fallugæ Ckll. Vega S. José; Continental Divide; Pecos,* fls. *Fallugia* (Grabham).
M. interrupta rociadensis Ckll. Rociada.*

ZACOSMIA Ashm.

- Z. maculata* Cress. M. V. Type from Nevada.

BOMBOMELECTA Patton.

- B. fulvida* Cress. M. V. Type from Nevada.
B. alfredi Ckll. M. V.*
B. larreæ Ckll. M. V.*

STELIS Panz.

- S. rudbeckiarum* Ckll. S. F.*; Gila River.
S. permaculata Ckll. S. F.*

ANTHIDIUM Fabr.*Canadian to Upper Sonoran.*

- A. occidentale* Cress. Beulah; San Ignacio; Pecos, Aug. 4; Glorieta, August 23; Raton.

Canadian to Middle Sonoran.

- A. maculosum* Cress. Tuerto Mtn., 8025 ft.; Barela Mesa (A. Gohrman); Mescalero; top of Organ Mts.; L. V.; M. V. Type from Utah.

Upper Sonoran.

- A. cognatum* Cress. Organ Mts. Type from Georgia.
A. lupinellum Ckll. Pecos.*
A. pecosense Ckll. Pecos.*

Upper to Middle Sonoran.

- A. porterae* Ckll. L. V.[®]; Pecos (mut. *amabile* Ckll.); M. V. The mut. *amabile* was taken at Boulder, Col., Aug. 5, 1906.

Middle Sonoran.

- A. parosetæ* Ckll. M. V.*

Locality Unknown.

- A. emarginatum* Say (*atrifrons* Cress.). "New Mexico." In Colorado this occurs from the Canadian Zone (Ward) to the border of the Upper Sonoran (Boulder).

DIANTHIDIUM Ckll.

- D. perpictum* Ckll. Beulah (1 ♂); Rio Ruidoso[®]; L. V.
D. gilense Ckll. Gila River[®]; Las Valles; Pecos, fls. *Geranium atropurpureum*.
 Aug. 21, ♀ (W. P. C.).
D. parvum Cress. S. F.; L. V.; Pecos; Organ Mts.
D. curvatum Smith. Albuquerque; Chaves; M. V.
D. larreae Ckll. M. V.[®]

MONUMETHIA Cress.

- M. albifrons* Kirby. Beulah; Mescalero.

OSMIA Panz.*Hudsonian Zone.*

- O. inurbana* Cress., var. (Mr. Titus thinks probably a distinct species). Top of Las Vegas Range; cf. Psyche, Dec., 1901, p. 283.

Hudsonian to Transition.

- O. faceta* Cress. Top of Las Vegas Range; Beulah; Mescalero.

Canadian Zone.

- O. fulgida* Cress. Beulah.
O. armaticeps sapellonis Ckll. Beulah.*
O. megacephala Cress. Head of Dailey Cañon, Las Vegas Mts.
O. densa Cress. Beulah.
O. nigrifrons Cress. Beulah; Johnson Park, July 4, fls. laco-weed (A. Gohrman).
O. nigrifrons subaustralis Ckll. Beulah.*
O. juxta Cress. Beulah.
O. n. sp. Titus. Rociada. This is the species which I considered to be *O. mandibularis* Cress.; Mr. Titus has seen the type of *mandibularis*, and finds it distinct.

Transition Zone.

- O. pusilla* Cress. Trout Spring, Gallinas Canon. Fls. *Iris* in May.
O. iridis Ckll. and Titus. Trout Spring.* Fls. *Iris* in May.
O. chlorops Ckll. and Titus. Trout Spring.* Fls. *Iris* in May.
O. bruneri Ckll. Barela Mesa (A. Gohrman).

Transition to Upper Sonoran.

- O. lignaria* Say. S. F.; L. V.; Romersville; Organ Mts.; Paraje.

Transition to Middle Sonoran.

- O. cerasi* Ckll. S. F.; M. V.*

Upper Sonoran.

- O. novomexicana* Ckll. L. V.*; Johnson Park, July 4. fls. loco-weed (A. Gohrman).
O. lignaria lignariella Ckll. L. V.; Romersville.*
O. ribifloris Ckll. L. V.; Romersville.*

Middle Sonoran.

- O. phenax* Ckll. M. V.*
O. prunorum Ckll. M. V.*

ALCIDAMEA Cress.

- A. biscutellæ* Ckll. M. V.*

CHELOSTOMA Latr.

- C. neomexicanum* Ckll. Barela Mesa,* (A. Gohrman).

HERIADES Spinola.*Canadian to Middle Sonoran.*

- H. carinatus* Cress. Beulah; S. F.; Mescalero; M. V.

Transition.

- H. crucifera* Ckll. S. F.*

Upper Sonoran.

- H. gracilior* Ckll. Rio Ruidoso, fls. *Rhus*; Pecos (W. P. C.); L. V.; Organ Mts.*
H. variolosus Cress. Rinconada.

Middle Sonoran.

- H. asteris* Ckll. M. V.*

ASHMEADIELLA Ckll.*Canadian to Upper Sonoran.*

- A. buconis* Say. Beulah; L. V.; Albuquerque.
A. cactorum Ckll. Beulah; S. F.*; L. V.

Upper Sonoran.

- A. opuntiae* Ckll. Organ Mts.*

Upper to Middle Sonoran.

A. meliloti Ckll. Organ Mts.; M. V.*

Middle Sonoran.

A. bigeloviæ Ckll. M. V.*

A. prosopidis Ckll. M. V.*

A. holtii Ckll. M. V.*

LITHURGUS Berthold.

L. apicalis Cress. S. F.; Pecos, fls. *Opuntia*, July 16 (W. P. C.).

L. apicalis opuntiae Ckll. M. V.*

L. echinocacti Ckll. Organ Mts.*; M. V. Visits *Echinocactus wislizenii*.

MEGACHILE Latr.*Hudsonian to Upper Sonoran.*

M. wootoni Ckll. Top of Las Vegas Range; Beulah; Rio Ruidoso* ; Trout Spring; Johnson Park; Pecos.

M. vidua monardarum Ckll. Top of Las Vegas Range; Crew's Mesa* ; Beulah; Rio Ruidoso; Pecos (W. P. C.); a variety with the scopa paler than usual, at fls. *Campanula rotundifolia*, auctt. Beulah, Aug. 16 (W. P. C.) In the ♂ I cannot separate this species from the European *M. willughbielli* Kirby.

Canadian Zone.

M. relativa Cress. Harvey's Ranch; Beulah, fls. *Polemonium*; Rociada; Rio Ruidoso.

Canadian to Transition.

M. pollicaris pereximia Ckll. Beulah* ; High Rolls (V.). This is the *pollicularis* of Cresson (Mr. Titus has compared it), but I think probably not the true insect of Say. Snow has taken it at Bill Williams' Fork, Arizona (det. Titus).

Canadian to Upper Sonoran.

M. sapellonis Ckll. Harvey's Ranch, 9600 ft.; Beatty's Cabin (W. P. C.); Beulah* ; White Mts.; Pecos, Aug. 17 (W. P. C.).

M. pugnata Say. Beulah; S. F.; L. V.; Mescalero; near Viveash Ranch, 8800 ft. fls. *Eriqeron*, July 21, ♀ (W. P. C.).

M. fidelis Cress. Beulah; L. V. H. S.; L. V.; Rio Ruidoso; Mescalero; Gila R.; San Ignacio; Burnt Canon.

M. montivaga Cress. Beulah, fls. *Genm* and *Rovipa*; Rio Ruidoso; Raton.

M. fortis Cress. Beulah; San Ignacio; L. V. H. S.; Las Valles; Rociada; Mescalero; Rio Ruidoso.

M. mendica Cress. Rio Ruidoso; Las Valles. Visits *Verbascum*.

Transition to Upper Sonoran.

M. latimanus Say. S. F.; L. V.; San Ignacio; Trout Spring; Pecos (W. P. C.); Raton.

M. exilis Cress. S. F.; L. V.; Gila River; Rio Ruidoso; L. V. H. S.; Las Valles.

M. manifesta Cress. L. V. H. S.; L. V.

M. cleomis Ckll. S. F.*; L. V.; Pecos; Albuquerque.

Transition to Middle Sonoran.

- M. pruina* Smith. L. V. H. S.; L. V.; Chaves; M. V. Extends to So. Calif. (Lower Sonoran).

Upper Sonoran.

- M. heterodonta* Ckll. L. V.*; Organ Mts.; Raton, Aug. 26.
M. brevis Say. Las Valles.
M. sayi Cress. Pecos; L. V., fls. *Verbena*.
M. emoryi Ckll. Pecos.*
M. sexdentata Rob. Raton, July 31, 1903 (Karl Schivackhein).
M. agustini Ckll. Pecos.* Extends to Los Angeles, Calif. (Lower Sonoran).

Upper to Middle Sonoran.

- M. occidentalis* Fox. Organ Mts.; M. V.*; Alamogordo (V.).
M. soledadensis Ckll. Organ Mts.*; M. V.,
M. cleomis lippiae Ckll. Gila River; Organ Mts.*; Roswell; Alamogordo (V.);
 M. V.
M. sidalceae Ckll. Lone Mtn.*; Organ Mts.; M. V.; Deming. Fls. *Prosopis*,
Opuntia, etc.

Middle Sonoran.

- M. chilopsidis* Ckll. Rincon; M. V.* Fls. *Prosopis* and *Chilopsis*.
M. populi Ckll. M. V.*
M. vallorum Ckll. Socorro; M. V.*
M. newberryae Ckll. M. V.* Fls. *Prosopis*.
M. townsendiana Ckll. Rincon; M. V.*
M. casadae Ckll. M. V.*
M. prosopidus Ckll. Rincon; M. V.; Alamogordo (V.). Fls. *Prosopis* and
Chilopsis.

COELIOXYS Latr.*Canadian Zone.*

- C. mæsta* Cress, Beulah.
C. porteræ Ckll. Harvey's Ranch, 9600 ft.*; Beulah (W. P. C.).
C. alternata Say. Beulah.

Canadian to Upper Sonoran.

- C. ribis* Ckll. Beulah; Romeroville.*
G. gilensis Ckll. Rio Ruidoso; S. F.; Gila River*; Gallinas River.

Transition to Middle Sonoran.

- C. octodentata* Say. S. F.; L. V.; Gila River; M. V.

Upper Sonoran (and Probably Transition).

- C. rufitarsis rhois* Ckll. Rio Ruidoso*, at about 6500 ft., fls. *Rhus*.
C. apacheorum Ckll. Mescalero.*
C. grindeliæ Ckll. Mescalero (a variety); L. V.*

Upper to Middle Sonoran.

- C. sayi* Rob. L. V., M. V.

Middle Sonoran.

- C. menthæ* Ckll. M. V.; Deming.*
C. deplanata Cress. M. V.

MELISSODES Latr.*Canadian to Upper Sonoran.*

- M. grindeliæ* Ckll. Tuerto Mtn., 8875 ft.; S. F.*; L. V. H. S.; L. V.; Pecos, fls. *Sphæralcea fendleri*, Aug. 17 (W. P. C.); Organ Mts. Extends to La Jolla, Calif. (Lower Sonoran).
M. confusa Cress. (*ruidosensis* Ckll.). Beulah; Rio Ruidoso; L. V.
M. blakei Ckll. Beulah*; Tularosa Creek, fls. *Chrysothamnus*.

Transition.

- M. hewetti* Ckll. S. F.*

Transition to Upper Sonoran.

- M. sphæralcææ* Ckll. S. F.*; Pecos.
M. menuacha Cress. S. F.; L. V.; Raton. Fls. *Grindelia*, etc.
M. pallidicincta Ckll. S. F.; L. V.; Romersville; Pecos; Organ Mts.; Gila R.*; Pinos Altos; Raton; Watrons; Gibson (A. Gohrman).

Transition to Middle Sonoran.

- M. agilis* Cress. S. F.; L. V.; San Ignacio; Organ Mts.; Albuquerque; Socorro; M. V. The var. *aurigenia* Cress. occurs at Las Vegas.
M. obliqua Say. S. F.; L. V.; Pecos; M. V.; Raton.

Upper Sonoran.

- M. gilensis* Ckll. Gila River*; L. V.; Organ Mts. Extends to San Pedro, Calif. (Lower Sonoran).
M. montana Cress. Gila River; Organ Mts. Typ. loc. Colorado.
M. humilior Ckll. Organ.*
M. martini Ckll. Las Valles.* Fls. *Petalostemon*.
M. chrysothamni Ckll. Embudo.*
M. mizeæ Ckll. L. V.*
M. pecosella Ckll. Pecos.*
M. glenwoodensis Ckll. Maxwell City, fls. *Grindelia* (Mize). Typ. loc. in Colorado.
M. nigrosignata Ckll. Near San Ignacio (W. P. C.). Typ. loc. in Arizona.
M. lupina Cress. Raton. 1 ♂, agreeing well with a co-type compared. Typ. loc. California.

Upper to Middle Sonoran.

- M. tristis* Ckll. L. V.; Magdalena Mts. (Snow); San Marcial; Organ Mts.; Mescalero; M. V.*; Raton.
M. menuacha submenuacha Ckll. Albuquerque; M. V.* Fls. *Helianthus* and *Verbesina*.
M. thelypodii Ckll. La Cueva, Organ Mts.*; M. V., fls. *Ipomœa*.

Middle Sonoran.

- M. townsendi* Ckll. M. V.*
M. kallstrœmiæ Ckll. M. V.*
M. kallstrœmiæ phenacoides Ckll. M. V.*
M. intermediella Ckll. M. V.* A variety occurs at Los Angeles, Calif.
M. helenæ Ckll. M. V.*
M. machærantheræ Ckll. Near White Sands.* Extends to Buckeye, Ariz.
 (Lower Sonoran).
M. helianthelli Ckll. M. V.*
M. paroselæ Ckll. M. V.*
M. pecosella verbesinarum Ckll. M. V.*
M. texana flaveriæ Ckll. Roswell,* fls. *Flaveria*.

Locality Unknown.

- M. herricki* Ckll. "New Mexico."*

MARTINELLA Ckll.

- M. luteicornis* Ckll. Rincon* ; M. V. Fls. *Prosopis*.

TETRALONIA Spinola.

- T. dilecta* Cress. L. V. ; Barela Mesa.
T. truttæ Ckll. Trout Spring, Gallinas Canon.*
T. annæ Ckll. Gibson.*
T. lycii Ckll. Engle ; M. V.*
T. crenulaticornis Ckll. Rio Ruidoso* ; Mescalero.

XENOGLOSSA Smith.

- X. pruinosa* Say. L. V. ; Pecos ; Mescalero ; M. V.
X. patricia Ckll. M. V.*
X. strenua Cress. M. V.

XENOGLOSSODES Ashmead.

- X. imitatrix* Ckll. and Porter. L. V.* ; Glorieta (W. P. C.).
X. eriocarpi Ckll. Organ Mts.* Extends to Brownsville, Tex. (Low. Sonoran).
X. gutierrezæ Ckll. Organ Mts.*
X. excurrens Ckll. Roswell.*
X. lippizæ Ckll. La Cueva* and Dripping Spring, Organ Mts.
X. neotomæ Ckll. Raton.*

ENTECHNIA Patton.

- E. grisella* Ckll. and Porter. Las Valles.*

DASIAPIS Ckll.

- D. ochracea* Ckll. S. F. ; M. V.* ; Soledad Canon, Organ Mts. (Townsend).
 Fls. *Sphæralcea*.

DIADASIA Patton.

- D. australis* Cress. Santa Fé Canon, 7700 ft., ♀ in flower of *Opuntia arborescens*
 in wet weather ; S. F.

- D. australis rinconis* Ckll. L. V.; Rincon*; M. V.
D. enavata Cress. M. V.
D. diminuta Cress. S. F.; L. V.; Mescalero; M. V.
D. sphæralcearum Ckll. M. V.*
D. megamorpha Ckll. M. V.*; by White Sands.

EMPHOROPSIS Ashm.

- E. salviarum* Ckll. Top of Organ Mts.*
E. n. sp. Vier. (cf. Can. Entom., July, 1905, p. 265).

CLISODON Patton.*Arctic-Alpine to Upper Sonoran.*

- C. terminalis* Cress. Truchas Peak, just above timber-line (W. P. C.); Harvey's Ranch; Beulah; Pecos; Mescalero; Clondcroft (V.).

ANTHOPHORA Latr.*Hudsonian to Upper Sonoran.*

- A. smithii* Cress. (incl. *cardui* Ckll.). Top of Las Vegas Range; Beulah (♂, Aug.); L. V. H. S.; L. V.; Mescalero; Lone Mtn.

Canadian to Upper Sonoran.

- A. neomexicana* Ckll. Beulah; Trout Spring; S. F.; L. V.*; Pecos.

Transition to Upper Sonoran.

- A. marginata* Smith (incl. *cleomis* Ckll.). S. F.; L. V.; Rociada; Pecos.
A. occidentalis Cress. S. F.; L. V.; Pecos; Mescalero.

Transition to Middle Sonoran.

- A. curta* Prov. S. F.; L. V.; Embudo; M. V. The var. *peritomæ* Ckll. occurs at S. F. and M. V.

Upper Sonoran.

- A. simillima* Cress. Placita, fls. *Ribes*.
A. gohrmanæ Ckll. L. V.*
A. portæ Ckll. L. V.; Romersville*; Engle. Extends to the Mojave Desert, Calif.
A. montana Cress. L. V.; Pecos; Vega S. José; Organ Mts.
A. urbana Cress. (incl. *alamosana* Ckll.). L. V.; Canada Alamosa; Albuquerque; Organ Mts.

Middle Sonoran.

- A. texana* Cress. M. V.; Deming.
A. lesquerellæ Ckll. M. V.*; Organ Mts.
A. phenax Ckll. M. V.*
A. affabilis Cress. Engle; M. V.
A. centriformis vierecki Ckll. Alamogordo (V.).*

ANTHOPHOROIDES T. and W. Ckll.

A. vällorum Ckll. M. V.*

ANTHOPHORULA Ckll.

A. compactula Ckll. Organ Mts.; M. V.* Extends to Brownsville, Texas
(Lower Sonoran).

A. sidæ Ckll. M. V.*

EXOMALOPSIS Spinola.

E. solani Ckll. Albuquerque; * Mescalero; Organ Mts.; M. V.

E. solidaginis Ckll. M. V.*

E. verbesinæ Ckll. M. V.*

CENTRIS Fabr.

Middle Sonoran.

C. morsei Ckll. M. V.*

C. morsei marginata Fox. M. V.* Extends to Douglas, Arizona, 3750 ft.

C. rhodopus Ckll. M. V.*

C. rhodopus pulchrior Ckll. M. V.*

C. cæsalpininæ Ckll. M. V.*

C. hoffmanseggianæ Ckll. M. V.*

C. cockerelli Fox. M. V.*

C. lanosa Cress. M. V.

XYLOCOPA Latr.

X. arizonensis Cress. Lone Mtn.; Organ Mts.; M. V.

CERATINA Latr.

C. neomexicana Ckll. Chicorico Canon, near Raton *; Rio Ruidoso; S. F.

C. nanula Ckll. M. V.*

PSITHYRUS Lep.

P. variabilis Cress. Tuerto Mtn., 8200 ft.

P. insularis Smith. Beulah.

P. cevallianæ Ckll. M. V.*

BOMBUS Latr.

Arctic-Alpine to Hudsonian.

B. frigidus Smith. Truchas Peak, above timber-line (W. P. C.); top of Las Vegas Range. Typ. loc. Arctic America.

Arctic-Alpine to Canadian.

B. flavifrons Cress. Truchas Peak, above timber-line (W. P. C.); top of Las Vegas Range; Beulah (Skinner). Var. *vegans* Ckll. is from top of Las Vegas Range.*

Arctic-Alpine to Transition.

B. huntii Greene. Truchas Peak, above timber-line (W. P. C.); top of Las Vegas Range; Harvey's Ranch; Beulah; Rio Ruidoso; Mescalero; Aztec. The synonymy of this species will be explained elsewhere by Mr. H. J. Franklin. Viereck reports var. *bifarius* Cress. from Beulah.

Hudsonian to Canadian.

- B. proximus* Cress. Top of Las Vegas Range; Harvey's Ranch; Beulah; Santa Fé Canon.
B. appositus Cress. Top of Las Vegas Range; Harvey's Ranch; Beulah; Santa Fé Canon; Rio Ruidoso.
B. juxtus Cress. Top of Las Vegas Range; Harvey's Ranch; Beulah; Santa Fé Canon; Rio Ruidoso.

Canadian Zone.

- B. proximus perixanthus* Ckll. and Porter. Harvey's Ranch, 9600 ft.²
B. monardæ Ckll. and Porter. Beulah; Santa Fé Canon *; Rio Ruidoso. Fls. *Monarda*, etc.
B. rufocinctus Cress. Beulah.
B. consimilis Cress. Beulah (fide Viereck).
B. centralis Cress. Cloudcroft (fide Viereck).

Canadian to Transition.

- B. prunellæ* Ckll. Beulah *; Rio Ruidoso; Mescalero. Ashmead has referred this to *silkensis*, but it is distinct from that species, as Mr. Franklin agrees.

Canadian to Upper Sonoran.

- B. iridis* Ckll. and Porter. Beulah *; Santa Fé Canon; Pecos. Fls. *Iris*, etc.
B. fervidus Fabr. Beulah; Rio Ruidoso; L. V.
B. nevadensis Cress. (*ressoni* Ckll.). Beulah; Rio Ruidoso; Mescalero; White Mtn., 10,300 ft. fls. *Delphinium* (Townsend); L. V.
B. dorsalis Cress. (*aztecus* Ckll. fide Franklin). Beulah; Rio Ruidoso; Mescalero; Aztec; L. V.
B. edwardsii Cress. Beulah, May 30 (W. P. C.); Pecos, June 25, fls. *Fallugia* (W. P. C.).

Transition Zone.

- B. proximus howardi* Cress. San Ignacio.

Transition to Middle Sonoran.

- B. morrisoni* Cress. S. F.; L. V.; Albuquerque; M. V.; Organ Mts.; Rio Ruidoso; Mescalero; Romersville; Pecos.
B. sonorus Say. Rio Ruidoso; M. V.; Pecos (a variety). Extends to San Pedro, Calif. (Lower Sonoran).

Upper Sonoran.

- B. scutellaris* Cress. L. V.

Upper to Middle Sonoran.

- B. americanorum* Fabr. L. V.; M. V.

APIS L. (introduced).

- A. mellifera ligustica* Spin. Beulah; S. F.; L. V.; Pecos, etc.

Undoubtedly many of the Middle Sonoran species range into the Lower Sonoran of Arizona and Mexico; how many, the imperfection of our knowledge prevents us from deciding. It is probable that the Middle Sonoran is to be distinguished from the Lower by the *absence* of various types existing in the latter, rather than by the presence of peculiar types of its own. The following species may be cited as occurring in the Lower Sonoran of Arizona, but apparently not entering New Mexico:

Centris atripes Mocs. (Douglas). *Ocœa tristis* Gribodo (Douglas). *Colletes tucsonensis* Ckll. (Tucson). *Xylocopa varipuncta* Patt. (Tempe). *Ceratina arizonensis* Ckll. (Phoenix). *Halictus kunzei* Ckll. (Phoenix). *Centris pallida* Fox (Phoenix). *Perdita baccharidis* Ckll. (Tempe). *P. mellina* Ckll. (Phoenix). *P. heterothecæ* Ckll. (Tempe, Phoenix). *Xenoglossa patricia angustior* Ckll. (Buckeye). *Hypomacrotera callops persimilis* Ckll. (Phoenix). *Bombomelecta arizonica* Ckll. (Tempe). *Triepeolus helianthi arizonensis* Ckll. (Phoenix). *T. pimarum* Ckll. (Alhambra).

Some of these reappear in the Lower Sonoran of Texas.

New Species.

Xenoglossodes neotomæ n. sp.

A small species with narrow abdomen in the ♀, allied to *X. lippia*.

♀.—Length about 10½ mm.; hair of face, cheeks and pleura white; of head and thorax above pale ochreous; differs from *lippia* in being smaller, with the abdominal bands yellowish instead of white; the apical one on the second segment entire; the black interval between the bands on the third wider, being of the same width as the apical band; the fourth segment ornamented like the third, with the margin of the apical band straight; the fifth and sixth segments heavily fringed with creamy-white hair, stained with reddish in the middle; the hair on inner side of basal joint of hind tarsi very light fulvous; the hair of thorax above strongly yellowish; the antennæ considerably shorter, and the flagellum more or less dark reddish beneath. Runs in my tables near *T. actiosa*, but the mesothorax is shining, and the abdomen is of an entirely different shape.

♂.—Length 10 mm.; more like *lippia*; hair of head and thorax white above and below, or faintly yellowish above; flagellum long, strongly crenulate, very dark reddish beneath; clypeus and labrum entirely pale lemon yellow; mandibles with a large yellow spot; abdominal segments with *only the apical hair-bands distinct*; tegulae pale testaceous.

In Proc. Biol. Soc. Wash., 1905, p. 179, I called attention to the *Xenoglossodes*-like palpi of *Tetralonia lippia*. The present species bridges over the gap between *lippia* and ordinary *Xenoglossodes* to a considerable extent, and I think both should be referred to that genus.

Hab.—Raton, New Mexico, August, 1 ♀, 2 ♂ (T. D. A. and W. P. Ckll.). *X. neotomæ* derives its name from *Neotoma*, the wood-rat, which gave rise to the name Raton.